

For Private Circulation Only.

DESCRIPTION OF
“BOW RIVER MINES”

THE PROPERTY OF

The Anthracite and
Bituminous Coal Co.

(LIMITED)

*Situated on the Main Line of the Canadian
Pacific Railway in*

ALBERTA, NORTH-WEST TERRITORIES OF CANADA.

HEAD OFFICE OF COMPANY:

15 TORONTO ST., TORONTO, CANADA.

Secretary, FRANK A. FLEMING.



RANGE 5

RANGE 4

PLAN
OF THE PROPERTY OF
The ~~ANTHRACITE & BITUMINOUS~~
~~COAL COMPANY.~~
TWP. 26 RANGES 4 & 5.
WEST OF 5 MER.

ALBERTA N.W.T.

SCALE



SEC. 13

SEC. 18

TO RADNOR
← 4 MILES

CANADIAN PACIFIC RY.

BOW RIVER
MINES

SIDING

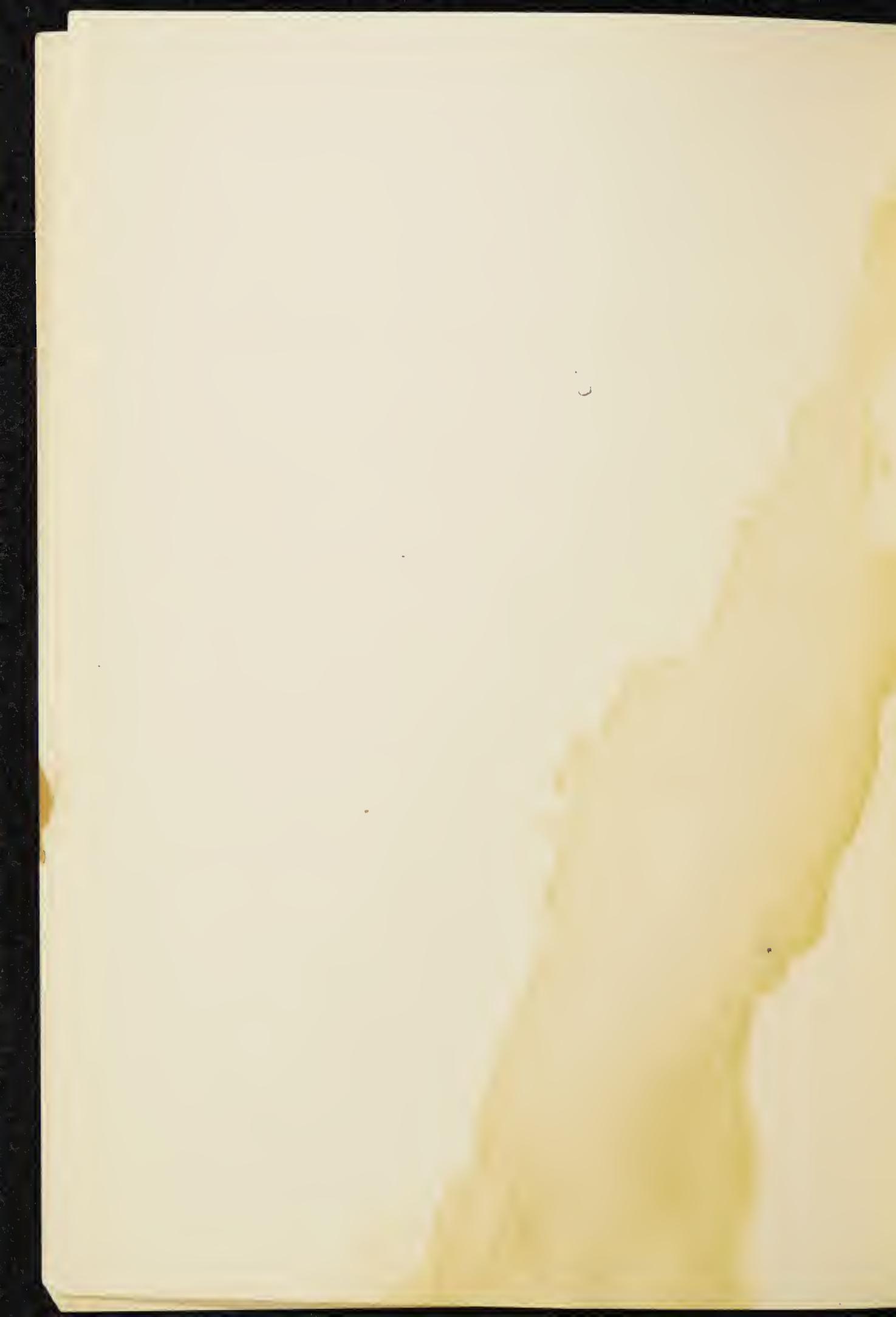
TO COCHRANE 3½ MILES
CALGARY 27 MILES

BOW RIVER

OF COAL

DIP 30°

SEC. 7



BOW RIVER MINES COAL PROPERTY.

A Bituminous Coal seam runs across the main line of the Canadian Pacific Railway, in a north-westerly direction, at a point some three miles west of Cochrane Station.

LOCATION The place is named Bow River Mines, and is
 621 miles distant from Vancouver, 321 miles from
OF Lethbridge (the Galt Mines), 862 miles from Win-
PROPERTY. nipeg, and 237 miles from Revelstoke, where a
 smelter has been built.

The property, owned by the Anthracite and Bituminous Coal Co. (Ltd.), consists of 1,600 acres, and controls the coal seam to a great depth, for about a mile on each side of the railway.

The land owned by the Company is composed of the following :

619.50	acres in Section 7, Twp. 26, Range 4 W. of 5th Meridian.
296.50	acres in W. $\frac{1}{2}$ Section 18, Twp. 26, Range 4, W. of 5th Meridian.
372.70	acres in Section 13, N. of Bow River, Twp. 26, Range 5, W. of 5th Meridian.
220 30	acres in Section 13, S. of Bow River, Twp. 26, Range 5, W. of 5th Meridian.
91	acres surface area occupied by river and railway.
<hr/> 1600	Total Acres.

COALS IN THE NORTH-WEST.

In the Canadian North-West a large amount of coal occurs from Manitoba to the Rocky Mountains. It is contained in the cretaceous formation (including the Laramie). That occurring in all the eastern

part is a lignite, changing as the Mountains are approached to a higher grade, until, at Bow River Mines, a Bituminous Coal is reached. The maximum result of the metamorphic influence from the pressure of the Mountains occurs in the Cascade Valley of the Rocky Mountains, where coal is found in the form of Anthracite. The following table containing analyses from the Government Geological Survey publications, 1884 and 1886, will give an unprejudiced illustration of this:

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>
Water	20.54	10.35	6.50	4.41	0.71
Volatile combustible matter	33.26	34.40	38.04	40.32	10.79
Fixed Carbon.....	41.15	39.61	47.91	48.27	80.93
Ash	5.05	15.64	7.55	7.00	7.57
Total.....	100.00	100.00	100.00	100.00	100.00
Coke	None.	None.	None.	Good.	None.
Approximate distance from Rocky Mountains, miles.....	156	96	66	24	0

a—Medicine Hat, lignite (Geological Society, fast coking).

b—Crowfoot, " " " "

c—Galt, " " " "

d—Bow River Mines, bituminous, " " " "

e—Cascade Valley, anthracite " " " "

MR. WALTON'S REPORT.

Mr. Wm. Walton, late superintendent of the Craig Coal Company, Fort Dodge, Iowa, and President of the Highbee Coal & Mining Co., Highbee, Missouri, on July 1, 1887, reported as follows on the coals of the North-West :

"I have made an examination of the following coals and coal mines in Manitoba and British Columbia on the line of the Canadian Pacific Railway.

"(1). *Medicine Hat.* This coal is a lignite too soft and brittle and "of little commercial value. I did not examine the mines.

"(2). *Crowfoot.* A lignite of superior quality, though brittle and "will crumble easily when exposed to the weather. The out-crop "occurs within four miles of the line of railway, and about eight "miles south-west of Crowfoot Station, it indicates a large deposit "and the vein runs from 10 to 14 feet thick, with three clay bands "from 4 to 12 inches thick running through it. The C.P.R. have a "shaft here with 7 feet of coal, and no clay bands, about 8 miles "north-east from the out-crop. There is no timber growing in the "vicinity of this deposit.

"(3). *Cochrane or Bow River Mines.* There are three slopes opening here; the first was made running about 35 degrees across the "strike with a considerable dip, and is about 500 feet in. It shows "but little improvements in quality compared with the out-crop. "The second opening runs with the dip and shows very satisfactory "improvements. At the face the bottom bench measured 2 feet 9 "inches.

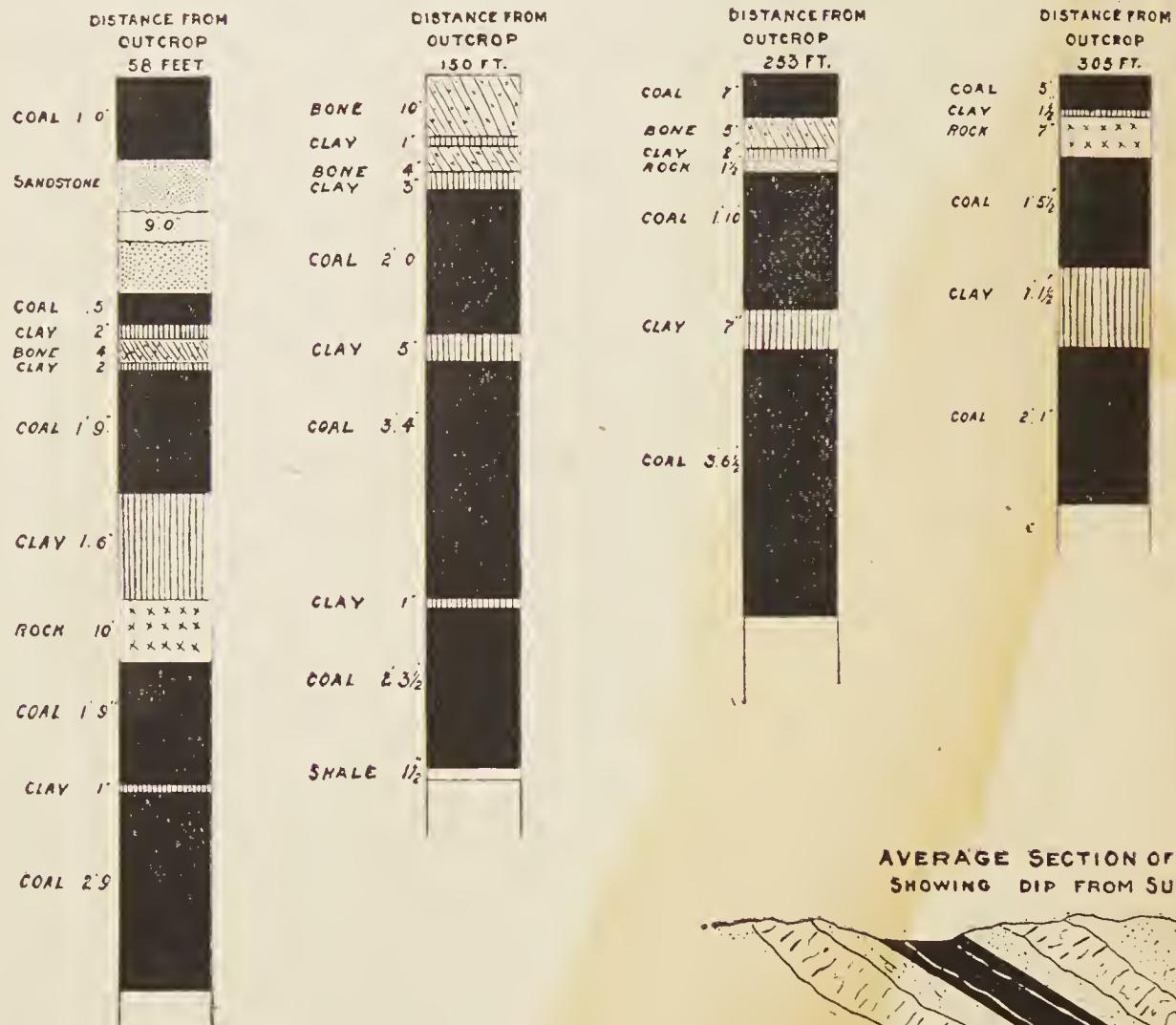
"The coal is compact black and glossy, and of a superior quality, "above this bench occurs a clay band running from 3 to 6 inches "thick, and above this 1 foot 9 inches of good coal, although a little "soft. Have no doubt, whatever, that a little further on in this direction a fine compact vein of excellent coal will be developed, of "at least $4\frac{1}{2}$ feet in thickness. The roof is composed of sandstone "at the opening, with shale coming in between it and the coal as "the work progresses. As far as developed it is rather brittle, but "will no doubt improve as the basin is reached. These two openings are within 200 feet of the railway. The third opening is "nearly one-half mile north-west beyond the Bow River and shows "good coal."

This last, (No. 3), is the "Bow River Mines" referred to in the first paragraph of this paper as the property of the Anthracite and Bituminous Coal Company.

Since Mr. Walton's report the second slope which he alludes to was sunk to a distance of over 500 feet, and is referred to further on under headings "Work Done," and "Section of Coal Seam."

CROSS SECTION OF COAL

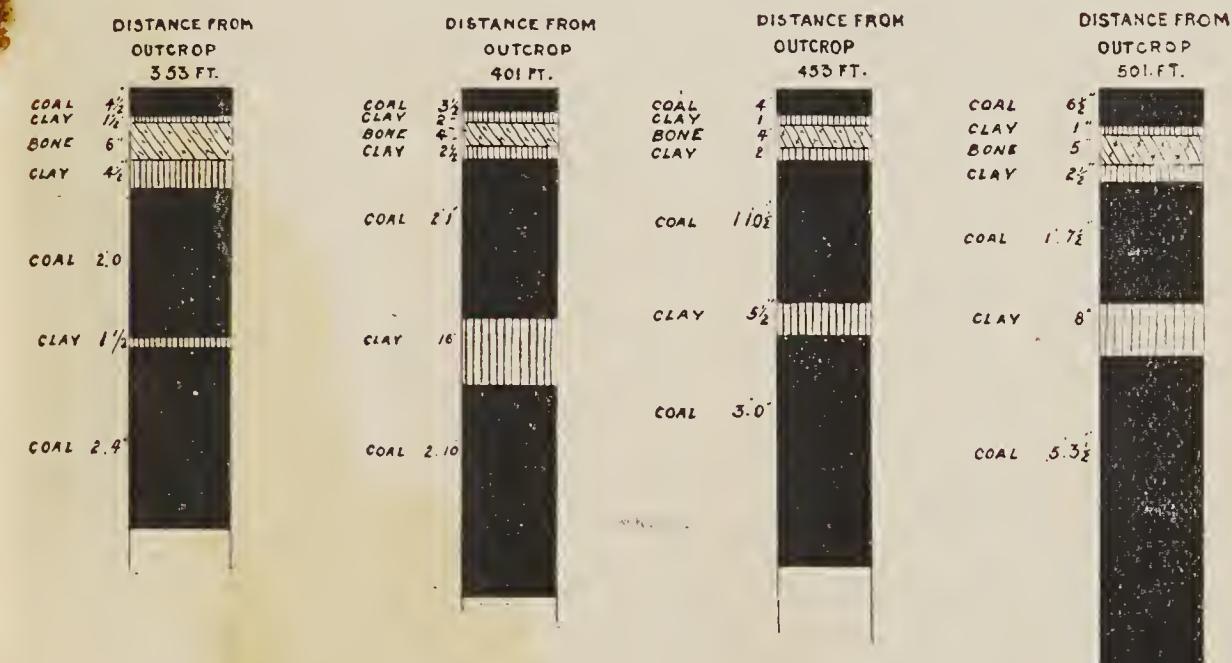
(SHOWING SECTION OF BED TAKEN AT STATED DISTANCES FROM THE OUTCROP)



SEAM AT BOW RIVER MINES

ALBERTA

DISTANCES FROM SURFACE (ABOUT EVERY 50 FT. BELOW 200 FT)
(TOP OF SEAM.)



SEAM
E.



GEOLOGICAL SURVEY REPORT.

Extracts from the Geological Survey Report, 1886, Vol. II, page 121. Referring to the coal seam at Bow River Mines to the south of the river, where above-mentioned shaft was sunk, Mr. Hoffman, chemist to the survey, gave analysis as follows:

COAL FROM THE SOUTH OF BOW RIVER.

<u>ANALYSIS.</u>	FAST COKING.
Hygroscopic Water	4.41
Votalite Combustible Matter.....	40.32
Fixed Carbon	48.27
Ash	7.00
	100.00

"The coke is firm and compact."

This report goes on to state :

"The coal is of excellent quality, and this seam will doubtless be "an important source of supply throughout all parts of the North-West Territory and Manitoba to which it can be carried by rail."

THE ONLY TRUE BITUMINOUS COAL.

The following are extracts from same Survey Report, page 147 E. "The only true Bituminous Coal yet found within the district is that out-cropping on the edge of the disturbed belt on the eastern side of the first anticlinal seam, as the mountains are approached in ascending the Bow River Valley" (at Bow River Mines).

ABOUT TEN MILLION TONS TO SQ. MILE

"Taking the thickness of the coal south of the river as seven feet and assuming that the dip gradually decreases to the eastward, this seam would contain about 9,500,000 tons of coal per square mile."

It might therefore be safely estimated from the above cautious calculation that there are at least more than 10,000,000 of tons underlying the lands of the "Anthracite and Bituminous Coal Company."

CANADIAN PACIFIC RAILWAY REPORT.

The following is from a publication issued by the Canadian Pacific Railway on "Dairy Farming, Ranching and Mining in the North-West, Alberta and Assinaboia." Page 13.

NOT INFERIOR "The quality of coals vary from a good
TO THE BEST "lignite on the east, to a good bituminous
PENNSYLVANIA "coal found twenty-five miles west of Calgary"
 ("At Bow River Mines") "and extending to the
 "vicinity of Canmore, a distance of thirty
 "miles from the last named point, to Banff is an Anthracite region,
 "the coal being not inferior to the best produced in Pennsylvania.

"The most workable coals are found at what are known as the "Bow River and Coal Creek Mines, and here a material change "takes place in their character, becoming bituminous, and yielding "a large quantity of tar and oil when submitted to heat, very fine "illuminating gas, and excellent coke, which will bear transportation. This coal is likely to prove valuable for smelting purposes, "in connection with the working of precious minerals in the mountains in the vicinity. It has proved very little inferior to the best "Pennsylvania bituminous coals in the several tests that have been "made.

"The main seam consists of seven feet of coal, with an overlying one of eighteen inches, and numerous smaller ones, all very similar in character."

MR. B. E. CHAFFEY'S STATEMENT.

1,000 TONS USED
BY THE C.P.R.

Mr. B. E. Chaffey, of Winnipeg, and President of the Anthracite and Bituminous Coal Company makes a statement, that he has been connected with this coal location since it was opened. That, during a period of a few months, some-

what more than 1,000 tons were furnished and used by the Canadian Pacific Railroad, but, owing to entirely inefficient machinery (all plant on ground being merely of a prospecting character and unsuitable for mining purposes), the mine was flooded in the spring and no mining work was afterwards carried on.

Mr. Chaffey states the Canadian Pacific Railway always expressed a willingness to take this coal if a suitable supply could be maintained.

Mr. Chaffey submits a letter and table from a comparative test by Mr. W. T. Reed, Master Mechanic of the Canadian Pacific Railway, which was made in locomotives hauling freight trains in January and February 1886, and reported by Mr. Reed to Mr. John M. Egan, the General Superintendent, on February 27, 1886.

BETTER THAN
THE GALT COAL

The test showed that the evaporating power of the Bow River coal was 22.7% higher than the Galt coal and that it produced very little clinker, considerably less than the Galt Coal.

WORK DONE AND SECTIONS OF
COAL SEAM.

Later on (in the Autumn of 1887), an inclined shaft was sunk down on the dip of the coal for 534 feet proving the existence of a good workable seam the whole way, and sections of which are given at about every fifty feet below 250 feet.

Alluding to the result of this work Dr. Geo. M. Dawson assistant Director of the Geological Survey states: "It is quite interesting in showing changes in the seam, as followed. You appear "to have a good thickness of coal throughout."

The seam averaged about five feet six inches thick. The bottom bench of the seam averaged from two feet to two feet six inches

thick of very good quality bituminous coal, but of friable character, giving nearly one half small coal. Above the bottom bench there is a bench of two feet thickness of coal of a harder character, but containing twice as much ash as the lower bench.

In the experience obtained from mining the coal, and in connection with sinking the inclined shaft, it was found, that, while the lower bench of coal was of a very good quality throughout (though friable owing to crushing pressure), that the upper bench of coal contained too much ash to be used on locomotives without special treatment. Most of the coal supplied to the road, above alluded to,

FUTURE was from the lower bench, which of course would be found more expensive to work alone. It is now proposed to mine the whole seam, which can be done much more economically, and to wash out the ash, which experiments on the coal have proved can successfully be accomplished at a cost of only a few cents a ton. After the adoption of a washing process it can therefore confidently be stated that there exists no coal seam along the line of the Canadian Pacific Railway from the Atlantic to the Pacific that can so immediately and so economically be utilized for the supply of an excellent bituminous coal.

OPERATIONS

COKING EXPERIMENTS BY GEOLOGICAL SURVEY.

Experiments were carried on by Dr. Hoffman, chemist, of the Geological Survey, as to the advisability of mixing this coking coal with Cascade Valley anthracite for the use of locomotives, as the anthracite coal alone was found to fall through the grate bars, and it is believed that the bituminous coal would prevent it from doing so. The following reports the result:—

" PARTS BY WEIGHT OF	CHARACTER OF COKE.
" Bow River Coal, 100	Semi-Anthracite, 50
" " "	Slightly coherent, very tender.
" " "	100 " " 30
" " "	Coherent, but very tender.
" " "	100 " " 20
" " "	Coherent, but tender.
" " "	100 " " 10
"	Coherent, moderately firm."

" The coal per se gave, by fast coking, a good firm coke."

So far as known this is the only coal in the North-West-Territories that is capable of being coked, and this is a matter of the greatest importance, as a very large quantity of ore is being found through the British Columbia mountains and a smelter has already been built at Revelstoke, as before mentioned, so the question of coke is a momentous one and a mine could probably be operated on coke alone.

This coal does not clinker as is the case with many other coals in the North-West.

MR. MERRITT'S STATEMENT.

Mr. William Hamilton Merritt, F.G.S., Mining Engineer, of Toronto, reports that he had charge of work of sinking the inclined shaft previously mentioned, and has since investigated the question of washing the coal to decrease the percentage of ash. He states that he is of the opinion, that, with proper mining machinery, and with a washing plant to decrease the amount of ash associated with the coal, that a higher grade of bituminous coal can be furnished on board the Canadian Pacific Railway cars, at a more reasonable price, than is possible to be obtained at present anywhere in the North-West-Territories of Canada.

He recommends the manufacture of briquettes from a portion of the coal.

TIMBER.

Timber for mining purposes is found not far off, both on the Ghost and Bow Rivers, and can readily be floated down to the mines.

MARKETS.

Owing to the fact that no mine is in operation along the Railway the Canadian Pacific Railway are taking about 70,000 tons per annum from the Galt Mine, 110 miles from their main line. A large proportion of this amount would naturally fall to the Bow River mines on the main line. The western portion of the main line and the steamships will consume more than 100,000 tons per annum.

The nearest large town is Calgary, twenty-seven miles east from the mines, population 3,000. It is surrounded by a good district which is being rapidly settled, filling up faster than any other part of the North-West. Calgary is considered one of the rising towns in Western Canada, and will consume a large amount of coal. East of Calgary there are a number of smaller places, until we come to the large towns of Regina, Brandon, Portage La Prairie and the city of Winnipeg, which open fields for a very large supply of coal.

In a westerly direction there is no bituminous coal mine along the main line of the Canadian Pacific Railway between this point and the Pacific Coast (Vancouver).

As has been before mentioned the amount of coke required for smelting in the west will be very large.

COST OF MINING.

As mining has never yet been undertaken on a proper scale at Bow River Mines it is not possible to quote the exact price which it will cost. Enough work, however, has been done to prove that the roof and floor become exceptionally good a short distance down, and that there is very little water below surface levels, and that no reason has been found to exist why this coal seam, with proper appliances, cannot be worked as economically as any ordinary dipping seam of five to six feet in thickness. It has been found in this district that Chinese labor considerably reduces the cost in many departments.

PRICE.

The Canadian Pacific Railway, it is understood, pay the Galt company \$3.50 a ton.

In 1887 the Canadian Pacific Railway agreed to take coal from the Bow River Mines at \$3.67 per ton, but, owing to the lack of proper mining plant, and for the reasons mentioned in Mr. Chaffey's statement, it could not be furnished. The Canadian Pacific Railway paid \$4.00 a ton for most of the coal they used from this place.

GENERAL NOTES.

The market, as the country develops, will become practically unlimited. There is a great scarcity of wood over the whole Prairie, so that the general public will be compelled to burn coal.

There are several important points to be remarked in connection with the Bow River Mine coal as follows:

It is the only bituminous coal on the line of the Canadian Pacific Railway.

It is the only known western coal near any Railway possessing coking properties.

Its accessibility (being on the main line of the Canadian Pacific Railway), ensuring it from snow blockades, giving it free access to the markets at all seasons, and enabling it to be furnished to the Railway at first cost.